Sandhi, mutation and contrast: laryngeal phonology in Plougrescant Breton

Laryngeal phonology in Plougrescant Breton: sandhi, mutation, and contrast

Pavel Iosad
Universitetet i Tromsø/CASTL
pavel.iosad@uit.no

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Talk outline

1. Laryngeal phonology in a Breton dialect
2. Final devoicing is loss of contrast, not loss of feature
3. Sandhi voicing is phonetic implementation (mostly)
4. Devoicing sandhi do not need [−voice]
5. Privative laryngeal features will do
6. Implications

Background

- Breton: a Celtic language, closely related to Cornish and Welsh
- Mostly described by Celtologists, dialectologists, and historical linguists
- Breton phonology remains seriously understudied (as opposed to syntax)
- Few proper phonetic studies, mostly aural transcriptions
- What can we do?

Previous work

Krämer (2000)

- Île de Groix Breton (Ternes, 1970)
- Argued to exhibit a ternary contrast between [+voice], [−voice], and [ovoice] segments
- Evidence for binary features
- Final devoicing is loss of features

Hall (2008)

- Same dialect, same source
- Privative features with feature geometry
- Feature disalignment
- Final devoicing is loss of features and loss of contrast

The present approach

- Work in progress, (almost) nothing is final
- Features are privative with feature geometry
- “Final devoicing” is loss of contrast
- Devoicing sandhi is
  - Either lexical phonology
  - Or failed mutation due to geminate inalterability
- Argument for substance-free phonology
- Tested on Plougrescant Breton (Jackson, 1960)

Breton dialects

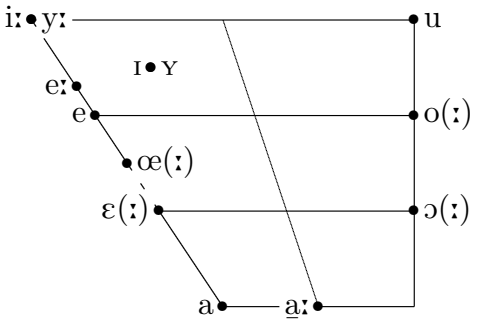
- Traditionally divided into four groups
  - Cornouaillais, Trégorrois, Léonais (KLT): relatively homogeneous, basis for standard language
  - Vannetais (south-east): very divergent, sometime even served by own literary tradition (Guillevic & Le Goff, 1902)
- Île de Groix is a Vannetais dialect
- Source rather messy (“phonemic” approach, not very systematic)
- Here: attempt to look at a less messy data point
- Plougrescant is a Trégorrois dialect; description by Jackson (1960) more systematic
- Further outlook: extend approach to Île de Groix if possible

Consonant inventory

	Place						
Manner	Labial	Alveolar	Postalveolar	Palatal	Velar	Uvular	Laryngeal
Stop	p b	t d		c ɟ	k g		
Fricative	f v	s z	ʃ ʒ			χ	h
Nasal	m	n		ɲ			
Lateral		l		ʎ			
Rhotic		r					
Glide	w			j			

- Length contrast for all consonants except voiced obstruents

Vowel inventory



- Length is only licensed by (main) stress

Restrictions on laryngeal features

- Voiced and voiceless obstruents contrast word-initially; short allophones

(1)

a.	[ˈpesk]	‘fish’
b.	[ˈbœːrɛ]	‘morning’
c.	[ˈloːgɔt]	‘mice’

- Voiced and voiceless obstruents contrast immediately following unstressed vowels; short allophones:

(2)

a.	[bɔˈtoː]	‘shoes’
b.	[ʃaˈdɛnːət]	‘chained (participle)’
c.	[kʏˈryːno]	‘peals of thunder’

Restrictions on laryngeal features

- Following long stressed vowels, consonants can only be short; voiceless obstruents do not occur:

(3)

a.	[ˈoːber]	‘to do; to make; to work’
b.	[ˈliːzər]	‘letter’
c.	[ˈmeːlən]	‘yellow’

- Following short stressed vowels, consonants are long; voiced obstruents cannot be long, so they are excluded:

(4)

a.	[ˈtapːut]	‘to take’
b.	[ˈjaχːɔχ]	‘more healthy’
c.	[skʏˈdɛlːo]	‘basins’

Restrictions on laryngeal features

- Word-finally following a stressed vowel, voiced obstruents are not permitted. Consonants are short following long stressed vowels and long following short stressed vowels.

(5)

a.	[ˈtoːk]	‘hat’
b.	[ˈmeːl]	‘honey’

(6)

a.	[ˈgrwɛkː]	‘woman, wife’
b.	[mɛlː]	‘ball’

Summary

- Leaving final devoicing aside for a moment, laryngeal features are mostly predictable:
- Laryngeal contrasts are allowed in the onset of the first syllable and of the stressed syllable
- Otherwise they are predictable:
  - Voiced following unstressed (always short) vowels
  - Voiced when single and following long stressed vowels
  - Voiceless (and long) when single and following short stressed vowels
- What is contrastive? What is marked?

Final devoicing

- At first blush final devoicing looks normal

(7) a. [bʏgaˈlɛɟjo] ‘children’
b. [bʏˈgaːlɪc] ‘child’

- But what about vowel length?
- This is a good question

Final devoicing in monosyllables

- The really interesting part is when a stressed vowel precedes
- Stress is normally penultimate in KLT (but not in Vannetais!), so this is mostly monosyllables and a few words with final stress
- If it is vowel length that is distinctive, we expect V:C#

(8) a. [ˈtoːgo] ‘hats’
b. [ˈtoːk] ‘hat’

- And cf. minimal pairs like

(9) a. [ˈkasː] ‘send!’ ([s] never voiced, French borrowing)
b. [ˈkaːs] ‘cat’ (cf. orthographic *kaz*)

Final devoicing in monosyllables

- This isn’t really devoicing in view of what we know about quantity and voicing
- This is incomplete neutralization
- Confer real devoicing:

(10) a. [lɔˈgoːdən] ‘mouse’
b. [lɔˈgɔtːa] ‘to hunt mice’

- Side note: it isn’t always about voicing per se:

(11) a. [ˈrɔːhis] ‘people of ar Roc’h’
b. [ˈrɔːχ] ‘ar Roc’h (placename)’

- Not really surprising if you know (some) [h] is historically *ɣ, but must be accounted for

Final devoicing in monosyllables

- Does real final devoicing happen? Well, yes
- There is variation described by Jackson (1960) as “free”, and especially with coronals
- Context probably unknowable; the ambition here is at best to find which representations are involved

(12) [tyːt]∼[tʏtː] ‘people’ (orthographic *tud*)

- More examples to come immediately below, as they involve sandhi to which we now turn
- What about lexically voiceless finals? These are relatively few, French borrowings of various antiquity, and behave as expected, cf. (9-a)

Sandhi

- The traditional view (Stephens, 1993; Favereau, 2001) is essentially that all consonants are voiced in sandhi before [+voice] segments

(13)

a.	[ˈpweːləz ˈãˑɔ̃]	‘if you saw me’
b.	[ˌma̲b ˈneːwe]	‘new son’
c.	[ˌpɔb ˈbiˑən]	‘little youth’

- And voiceless before voiceless consonants

(14)

a.	[ˌma̲p ˈhiːr]	‘tall son’
b.	[ən ˌdyt ˈkapːap]	‘the able people’

Sandhi

- Plus there is the devoicing sandhi that is the focus of Krämer (2000) and Hall (2008)
- For Île de Groix Ternes (1970) describes it as a lexical distribution: some words, and only these words, devoice initial obstruents following an obstruent
- For Plougrescant, Jackson (1960) is less concerned: “sometimes”

(15)

a.	[ˈla̲ːt tĩ]	‘said to me’, cf. [dĩ] ‘to me’
b.	[ˈkankuʃ]	‘100 times’, cf. [ˈtɛrguʃ] ‘thrice’

Sandhi

- In the narrative texts given by Jackson (1960), the sandhi rules are often violated
- Especially with regard to sandhi voicing

(16)

a.	[ˌma̲p ˈdyː]	‘black son’
b.	[ˌmɛrχ ˈva̲ːt]	‘good girl’
c.	[ˈdwaːn tœs ˈdiːwĩ]	‘the fear that you have of me’

- Jackson (1960) explains the the texts were dictated at a slow pace
- However, some (in fact most) of the examples, such as (16-a) and (16-b), are transcribed with a secondary–main stress rhythm; these are possibly genuine connected phrases
- Thus failure of sandhi is not necessarily an artefact of dictation
- Note that vowels outside main-stressed syllables are shortened, so the preservation of length contrasts under devoicing does not work in the same way when stress is secondary

Outline of analysis

- Outline feature analysis
- Argue that final devoicing without length permutations is a phonetic process
- Argue that sandhi voicing is the flip side of final devoicing
- Unify some devoicing sandhi with “failure of mutation”
- Tentatively propose that other devoicing sandhi are an artifact of univerbation

Feature analysis

- Before we even discuss final devoicing, we should solve the [voice]/[spread glottis] problem
- Phonetics rather poorly understood
- Voiceless stops are described as aspirated (at least initially) at Le Bourg Blanc (Falc'hun, 1951) and Saint-Pol-de-Léon (Sommerfelt, 1978), but these are both Léonais
- No mention of aspiration is made for Plougrescant by Jackson (1960, 1967)
- In all cases the voiced stops are described or assumed to be voiced
- One possible point: at Plougrescant fricatives underwent a context-free voicing ("new lenition"), cf. Southern English Fricative Voicing, which Honeybone (2005a) takes as evidence for [spread glottis]:∅
- But Honeybone (2005a) himself admits the analysis of fricatives should not be spread to stops uncritically

Feature analysis

- In substance-free phonology with emergent privative features, this point is rather moot
- We are interested in the patterning, whether the "voiceless" obstruents are labelled [spread glottis] or [voiceless] (cf. Blaho, 2008) is irrelevant
- Or voiced stops are [voice] or [stiff], of course
- I propose that in Plougrescant Breton "voiceless stops" are [voiceless] and "voiced stops" do not bear a laryngeal feature, but do have a laryngeal node
- I return below to why nodes are better than features
- Main reason is restricted distribution: only initial and stressed syllables, both reasonable contexts for positional faithfulness (Beckman, 1999; Smith, 2002)
- We need to make reference to this feature to derive the restrictions (but not to describe final devoicing as I argue below)
- In that sense it is "marked" (Trubetzkoyan markedness)

Final devoicing

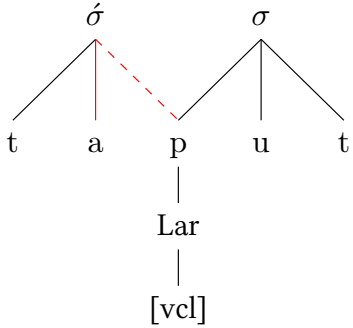
- I propose that final devoicing is in fact loss of the laryngeal node, i. e. it is the exclusion of the very possibility of contrasting for laryngeal features
- Devoiced stops are a third phonological category: they behave differently from true voiceless stops in that they do not obey length-related restrictions
- True voiceless stops cannot follow long vowels; devoiced stops can
- In particular, what is the difference between final devoicing as in [tyːt] and final devoicing with gemination as in [tʏtː]?
- No tableaux in analysis (but hopefully it is pretty theory-independent)

Assumptions of analysis

- Vowel length distinctive in main-stressed syllables: faithfulness ≫ markedness in this context
- *[voiceless] above Max[vcl]
- Except for positional faithfulness: Max[vcl]/Initial and Max[vcl]/$\acute{\sigma}$ above *[vcl]
- Bimoraic template for main-stress syllable (Main-to-Weight): McGarrity (2003); Bye & de Lacy (2008)
- Final devoicing driven by a constraint *Lar/_]$_{\text{Wd}}$ militating against any segments with a laryngeal node at the end of a (morphological?) Word

Medial obstruents: /Vt/

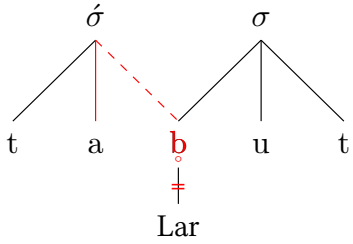
- Obstruents are long and voiceless following short stressed vowels



- The voiceless obstruent piggybacks on Main-to-Weight to be parsed into the stressed syllable and thus keep [vcl]
- This is assuming (as I do) that faithfulness to vowel length is undominated

Medial obstruents: /Vd/

- Assuming richness of the base, what happens with voiced obstruents after short vowels?



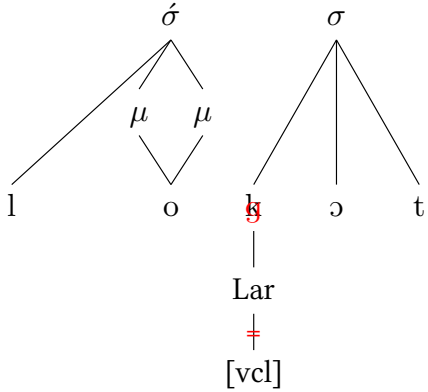
- Assume a constraint *Lar/μ: geminates without laryngeal specifications exist in the language (geminate sonorants)
- This is of course outranked by positional faithfulness to [vcl] to derive the previous case

Medial obstruents: /Vd/

- The obstruent loses its laryngeal specification in order to become moraic for the benefit of Main-to-Weight
- Laryngeally unspecified obstruent geminates are realized as voiceless for obvious phonetic reasons
- Maybe these are excluded by Lexicon Optimization since the learner never really has to posit /b̥ː/?

Medial obstruents: /Vːt/

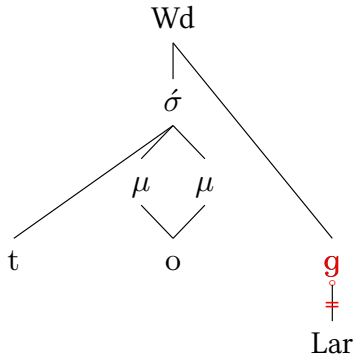
- This is a simple case



- No superheavy syllables, so [vcl] cannot be saved

Final devoicing: voiced stops

- No Lar node word-finally
- Final consonant is extrametrical (so maybe no Lar node not licensed by prosodic structure?)
  - Stress: ultimate if V: in final syllable, else penultimate. Moraic trochee, but then final V̆C must be L

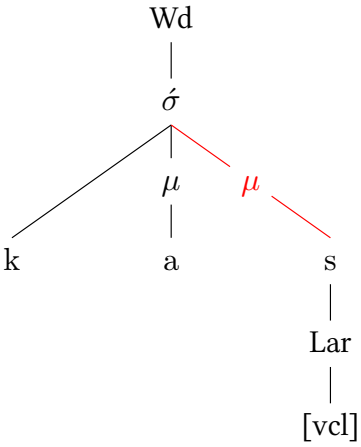


Final devoicing: voiced stops

- Laryngeally unspecified obstruents in pausa are realized as voiceless, phonetic reasons are well-known
- What if our [vcl] is really [spread glottis] in this dialect?
- It is apparently unproblematic to have aspiration as the phonetically natural realization of phonological underspecification (Vaux & Samuels, 2005)
- What about cases such as [tyːt]~[tʏtː]?
- I propose this is real final devoicing, i. e. the imposition of the [vcl] feature at word (phrase?) edges (Iverson & Salmons, 2007)
- First let's look at underlying voiceless obstruents

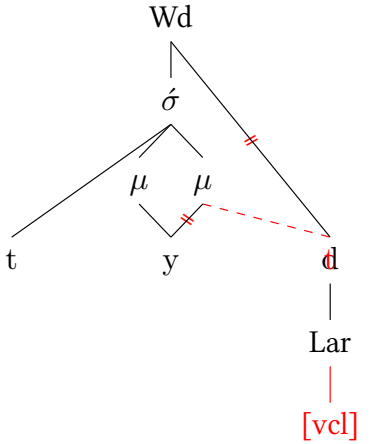
Final voiceless stops

- The [vcl] obstruent becomes moraic to satisfy Main-to-Weight, so the restrictions on vocalic quantity hold



True final devoicing

- In this scenario, forms such as [tʏtː] for /tyd/ imply that the constraint driving final devoicing is ranked over faithfulness for vowel length.



Final devoicing: summary

- I have argued that what looks like normal final devoicing is in fact the deletion of a Lar node, or absence of contrast
- Further evidence: final /v/ does not always neutralize with /f/ phonetically: Jackson (1960) writes [v̥]
- We know [v] is aerodynamically complicated (Padgett, to appear)
- So this would be consistent with a phonologically underspecified /v̥/?
- Final devoicing as final fortition (Iverson & Salmons, 2007) is distinct from this process and also attested
- Grazing other dialects: final devoicing is optional at Saint-Pol-de-Léon (Sommerfelt, 1978) (?)

Voicing assimilation sandhi

- Before obstruents, we are faced with two options
- Same as above
  - Explains possible devoicing even before voiced obstruents
  - Possibly predicts that under certain phonetic circumstances final consonants may be voiced before voiceless consonants?
- Spread of Lar, with [vcl] if need be
  - Variation must have a phonological explanation (stochastic ranking?)
  - Devoicing sandhi crucial piece of evidence in favour

Voicing sandhi

- In this system, voicing sandhi arise from two sources
- Before sonorants: laryngeally unmarked stops are voiced in the phonetics
- Sonorants do not contrast for laryngeal features, so they do not have a [Lar] to spread
- Explains variability (pause-sensitivity?)
- No need to have (contrastive) laryngeal features for sonorants (Krämer, 2000; Blaho, 2008; Hall, 2008)
- [ˌma̱b ˈneːwe] = /maḇ neːwe/

Devoicing sandhi

- Some examples of devoicing sandhi

(17)
a. [ˈla̱ːt tĩ] ‘said to me’
b. [me ˈgaf tĩ] ‘I find, I consider’ (lit. ‘I get to me’)
c. [ˌdɔ ˈwenːək ˈtit] ‘your two sous’ (lit. ‘two sous to you’)

- Prepositions are overrepresented
- Actually, this is also true of Île de Groix!

(18) [tra nəˈvaŋk temp]‘we don’t miss anything’ (lit. ‘nothing is missing to us’)

- What’s with the prepositions?

Detour 1: mutation

- Breton is (widely?) known for its initial consonant mutation
- Here we are only interested in lenition

Underlying	p	t	k	b	d	g	m
Mutated	b	d	g	v	z	h	v

- The interesting bit is the voicing of voiceless stops

Detour 2: prepositions

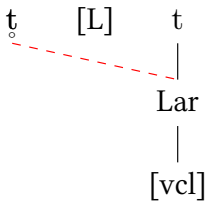
- Historically, prepositions in Brythonic have tended to undergo the effects of soft mutation/lenition in a context-free way
- Old Welsh and Old Breton *gurth* 'through', Modern Welsh *wrth*, Modern Breton *ouzh*
- Old Welsh *di* 'to', Modern Welsh *i* (via *[ði])
- Modern Welsh variation: *trwy* ∼ *drwy* 'through'

Detour 2: prepositions

- Why is this important?
- At least in Welsh, there is evidence that the new initial consonant is not fully lexicalized
- In particular, **gan* 'with' is historically **kant*
- The conjunction *a* 'and' causes a mutation whereby voiceless stops are spirantized to [f θ χ] but voiced ones are unaffected
- We expect **a gan* for 'and with', but it is actually *a chan* (Morgan, 1952; Ball & Müller, 1992)
- The same is true of *dros* and *drwy* though there the variants with the voiceless stop survive in the modern language
- So maybe *gan* is really [L]*can* underlyingly
- Where [L] is the autosegment (Wolf, 2007)

Back to Breton: devoicing sandhi

- I propose that (some) Breton devoicing sandhi reflect the same incomplete lexicalization of the voiced stops
- Consider *lavare*[t t]*iñ*



- Normally, [L] docks to the following /t/, e. g. due to MaxFlt (Wolf, 2007)
- But not when the Lar node spreads to a preceding root node

Devoicing sandhi

- This can be for any number of reasons
  - Some version of geminate inalterability
  - Structure sharing inhibits weakening processes (Honeybone, 2005b)
  - Under certain assumptions, the structure shown is not convex (Scobbie, 1997)

Devoicing sandhi

- Further evidence for this approach comes from so-called "failure of mutation" (Jackson, 1967, §481)
- Lenition of voiceless stops is said to "fail" when an adjective (given the necessary morphosyntactic conditions) follows an obstruent-final noun
- But with sonorant-final nouns or voiced stops mutation happens
- Cf. *kaer* 'beautiful'

(19) a. un dimezell gaer
a maiden beautiful
b. ur vaouez kaer
a woman beautiful

- Morphosyntax actually irrelevant, since other triggers of this mutation are sonorant-final

Devoicing sandhi

- This is the same phenomenon: an autosegment normally leading to voicing is inhibited by spreading of the Lar node
- Following sonorants the Lar node can't spread since sonorants with a Lar node are never well-formed
- But this time we have much better evidence for the autosegment being there
- The same data are described by Ternes (1970) in an extremely convoluted way…
- The generalization: if an obstruent is voiced by an autosegment, it can resist voicing by spreading Lar to a preceding obstruent

What, autosegments?

- In previous work I have doubted that the autosegmental approach is suited to Brythonic Celtic mutations (cf. also Green, 2006)
- I think these data are actually pretty solid evidence for autosegments or at least for a phonological analysis
- Breton is less problematic than Welsh morphosyntactically
- Breton mutation seems to be genuinely sensitive to prosody (Pyatt, 2003)
- There is still the problem of doing mutation phonologically: Wolf (2007) covers only a small subset
- In particular, the autosegment should cause deletion of [vcl] in the current approach
- Problem! But see Bye & Svenonius (2009) for an approach…

More devoicing sandhi

- Other types of devoicing sandhi do not seem to fall under this rubric

(20) a. [san kɔˈneːri] ‘Saint Gonery’
b. [ˈkankuʃ] ‘thrice’, cf. [ˈtɛrguʃ] ‘thrice’

- I propose that here devoicing is due to univerbation, i. e. the relevant words are now compounds
- Word-internally voiceless obstruent clusters are (nearly) universal (also noted by Hall, 2008 for Île de Groix)

More devoicing sandhi

- Jackson (1967, §487): “provection in common phrases”
- Are these actually phrases or words?
  - Saint Gonéry is the patron saint of the local chapel

  - ‘Thrice’ might well be a single word, cf. Welsh *dwywaith* ‘twice’, and in fact *[guʃ] is the reduced form, cf. stressed *gwej* ‘time, occasion’
  - Etc.

Photo credit: Steffen Heilfort. Source.

Summary and outlook: sandhi

- Voicing sandhi are mostly due to phonetic implementation of laryngeally unspecified obstruents in a phrasal context
- Some devoicing sandhi are due to inhibition of autosegmentally induced voicing
- Others might possibly be not phrasal sandhi at all
- Both of these phenomena seem to be cross-dialectal, so the account possibly extends to Île de Groix:
  - Prepositions
  - More examples: the “devoicing” word [bəˈnak] ‘any’ is Middle Breton *pennac* (Lewis & Piette, 1962, §45)
  - The “provection in common phrases” (univerbation) is described as pan-Breton. Examples of devoicing sandhi in Île de Groix include ‘grey peas’ and ‘little finger’—intuitively good candidates for univerbation

Loss of feature or loss of contrast

- Here I have argued that Breton presents examples two types of final devoicing
  - Final devoicing as loss of contrast: cf. the arguments of Harris (2009) for FD as weakening
  - Final devoicing as edge alignment: final fortition (Iverson & Salmons, 2007)
- Take-home message here: there is no process of “final devoicing”, “final weakening” or “final fortition” that we can speak of in universal terms
- Argument for substance-free phonology

Final devoicing as phonetics

- Growing body of work on final devoicing (and generally laryngeal assimilation) as a "low-level phonetic process"
- The *Paradestück* here is of course Dutch (Ernestus & Baayen, 2006, 2007; Jansen, 2007)
- Possibly others (e. g. the disputed claim for Polish)
- Breton seems to show quite good evidence for incomplete neutralization
- Laryngeally unspecified segments interpreted by the phonetics as devoiced or aspirated rather than [−voice] or [spread glottis] specified
- Needs careful cross-linguistic study

Ternary contrasts

- Krämer (2000) argues that the presence of both voicing and devoicing necessitates binary features, i. e. a ternary contrast
- Related issue: Uffmann (2009) asks how to distinguish between categorically voiceless and laryngeally unspecified stops in a privative system
- The answer is of course feature geometry
- Objection of Uffmann (2009): but this is an overgenerating notational variant of binary features

Ternary contrasts

- One answer: who says we never need bigger feature geometry trees? It is correct that arboreal representations can have many levels, but maybe this is empirically better?
- Related answer: binary features are no more God-given/less stipulative: [0voice], [1voice] and [2voice] are also a notational variant, but these are as overgenerating as trees
- Reason: three independent values of [F] cannot capture implication relations in the same way that feature geometry can
- Here I argue that the feature geometry/underspecification approach is empirically more adequate than one based on [±voice] spreading

Tiers or features?

- Here I use class nodes (as in e. g. Avery, 1996)
- Blaho (2008): no need for nodes if features can do the job, e. g. substitute Lar with [obst] since only obstruents are laryngeally specified
- Gives strange results for Breton, since final devoicing is driven by *[obst]: works formally but how insightful is it? Are the devoiced obstruents sonorants? (Well, why not)
- Here: nodes are necessary

Tiers or features?

- If features can only attach to nodes, the presence of a node (even with no features) is the formal correspondent of contrastive specification
- Sort of answers the concern of Uffmann (2009) on the difference between two types of feature absence
- Without nodes, how do we define tiers and all the autosegmental phenomena that come with them?
- Null hypothesis: all and only features dependent on a specific node are on the same autosegmental tier
- Field of empirical inquiry

Summary

- New interpretation of Breton data
- Possible cross-dialectal extension
- Privative features can do the job
- Feature/node geometry is preferable to binary features and (possibly) to node-less geometry.

Trugarez!

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